Rapid Port Enhancement Overview

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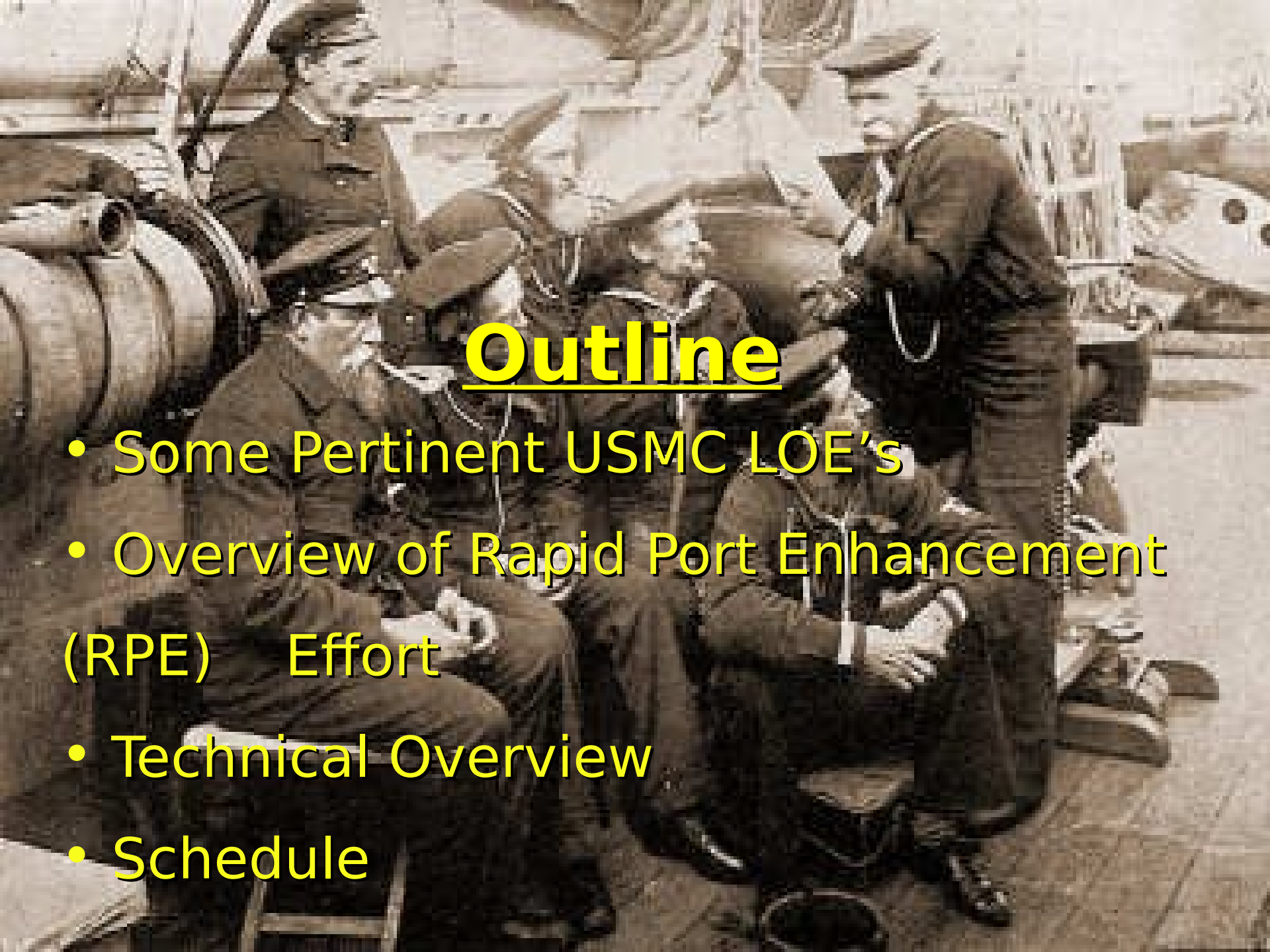


Outline

- Some Pertinent USMC LOE's
- Overview of Rapid Port Enhancement (RPE) Effort
- Technical Overview
- Schedule

USMC LOE's

Major Experimental Objectives Include:

- Focus on development of required technologies needed to enable ship-to-ship and ship-to-causeway interfaces.

- Develop concept of HSV in support of riverine operations.

- Develop concept of HSV support of operations including insertion/ sustainment/ extraction and as a C4I platform

USMC LOE's : Partial Findings

- HSV - RRDF interface successfully demonstrated
  - Personnel transfer at 2-3 foot waves
  - Mooring loads on HSV suggested that safe limit operating condition was reached under some operations
  - Metal-to-metal contract between HSV and causeways sections (RRDF, floating pier, etc.) are a mooring concern due to the likelihood of hull punctures.
- HSV – small harbor test successfully demonstrated at Del Mar Boat Basin, Camp Pendleton
  - Floating causeway required for equipment transfer to shore
  - Maneuverability of HSV encountered no problems
- HSV "break-bulk" cargo transfer demonstrated
  - Slow and time consuming

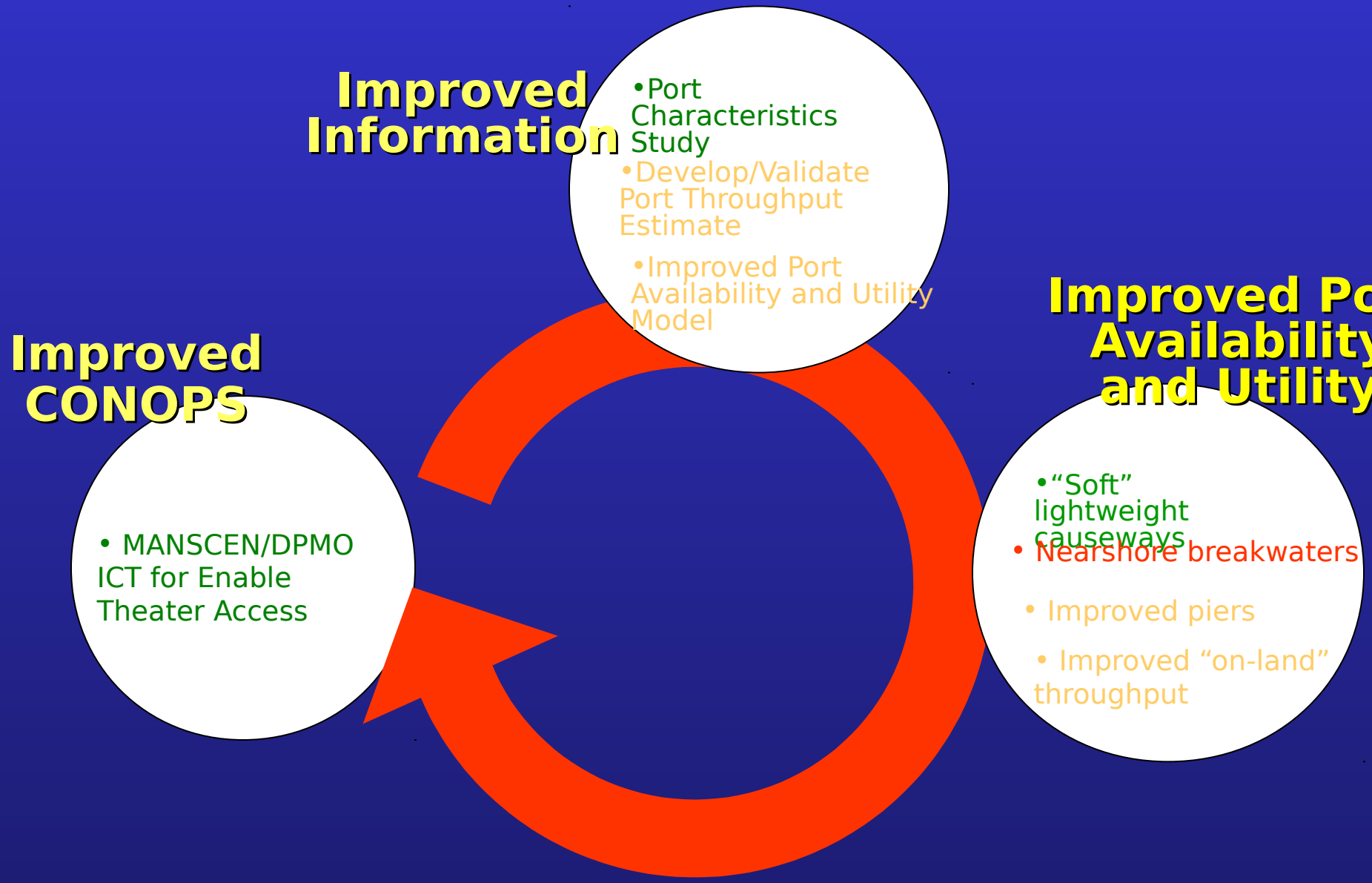
The TSV is an important step forward in meeting future Force Projection requirements

- TSV used for intratheater lift will permit access to five times more ports than available to current sealift ships
- However, as noted by the *Army Science Board*, in order to maximize vessel utility we should "develop technology alternatives to offboard ships rapidly in austere ports"

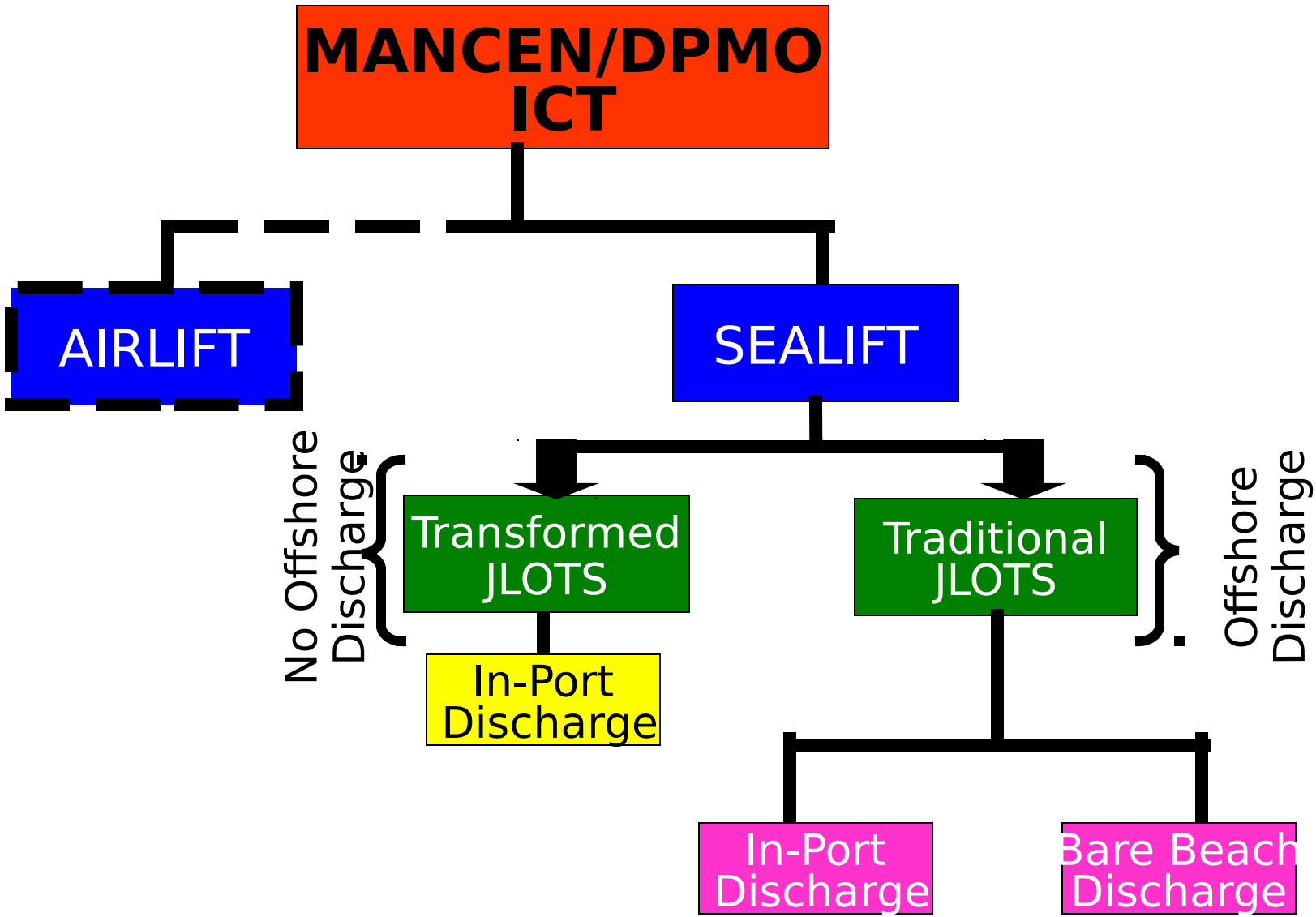
Objective Force Maneuver Support Imperatives

- Understand the Battlespace Environment
- Enable Theater Access
- Provide Assured Mobility
- Deny Enemy Freedom of Action
- Enable Force Protection and Security
- Engage and Control Populations
- Neutralize Hazards and Restore the Environment

RPE Overview

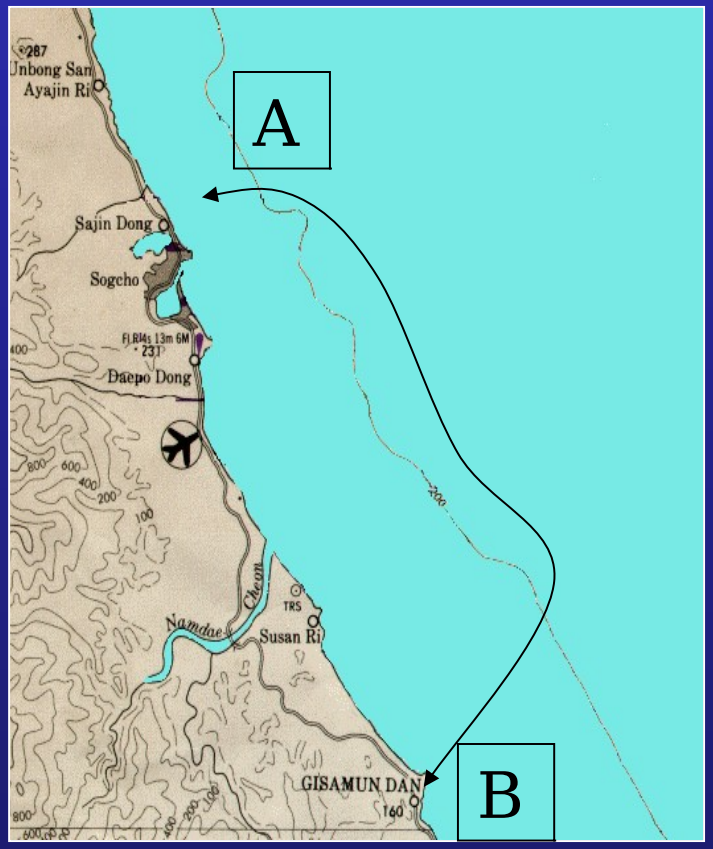


Enable Theater Access (ETA)



POTENTIAL ADDITIONAL ROLE OF RPE/TSV

- MOBILITY WHEN TRANSPORTATION BY LAND IS DENIED OR UNSUITABLE



- TUNNEL DESTRUCTION
- NO INFRASTRUCTURE
- NBC AVOIDANCE

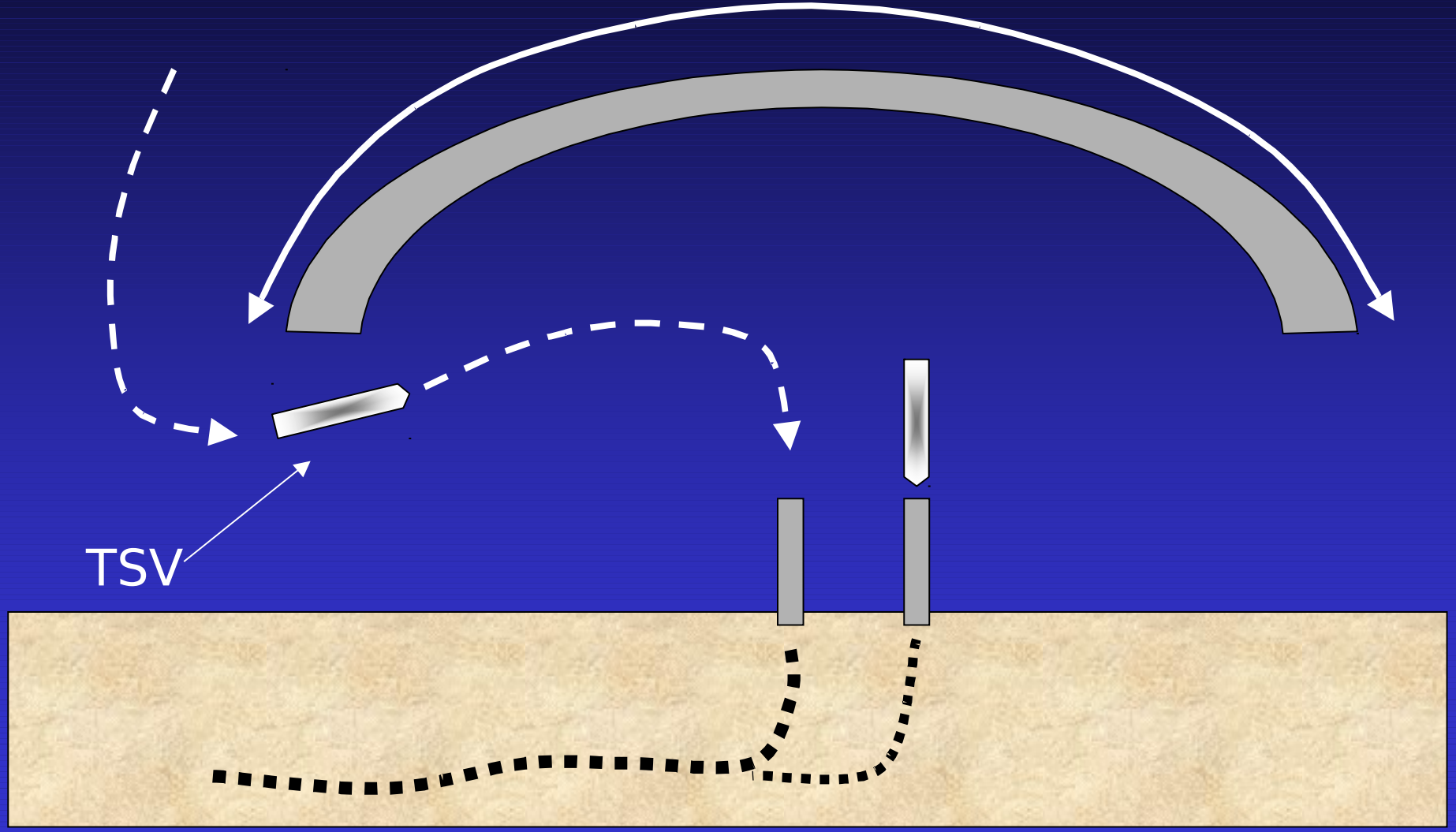
Riverine Maneuver Suppo

Issues:

- Flexibility to extended Force Projection Inland
- Can Avoid potential obstacles
- Infrastructure for ship – interface is typically very austere

OBJECTIVE FORCE LOTS

Bare Beach Scenario ~ 1500 ft



New ERDC-CHL Initiative:
Rapid Port Enhancement

Goal: Anticipate Potential Problems in Small Ports and Develop Remedial Measures

Port Access

Natural

Limited port access due to navigation channel depth, wave, current, tides or adequate port does not exist

Man Made

Port is denied by enemy

- NBC hazards
- Fill channel into port

Port Utility

Natural

Limited Existing Infrastructure

- Pier load capacities
- Limited in-port space
- Height of offload points
- Inadequate roads through and out of ports
- Depths adjacent to offload points

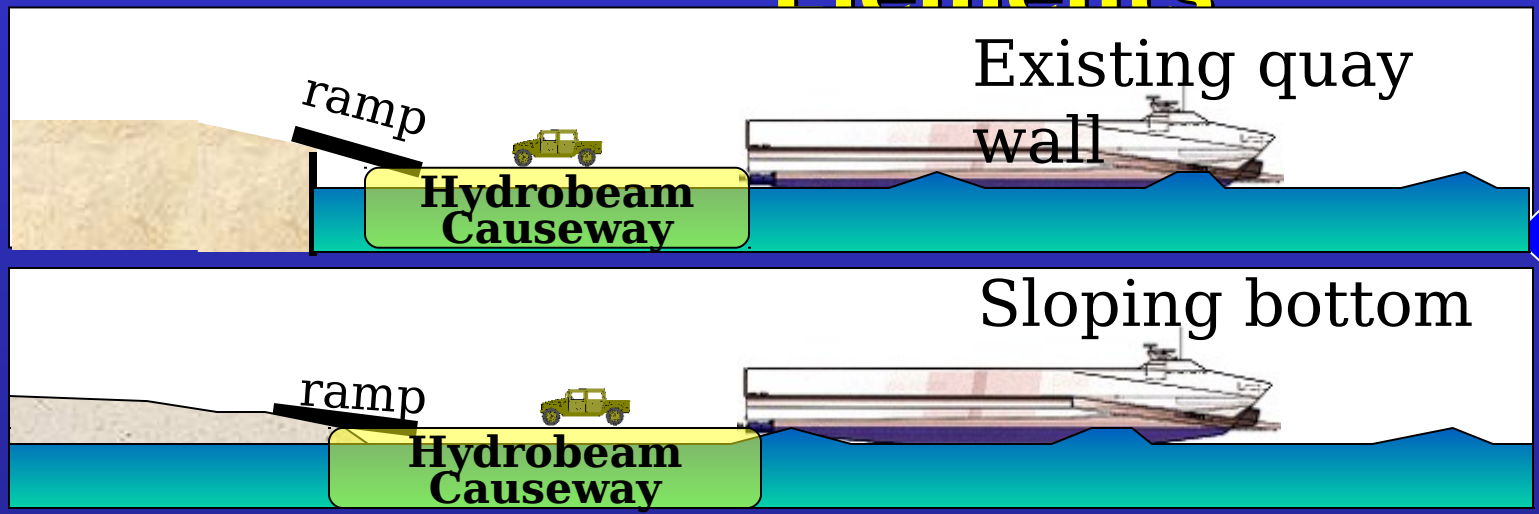
Man Made

Damage Infrastructure

- Breakwaters
- Piers
- Roads

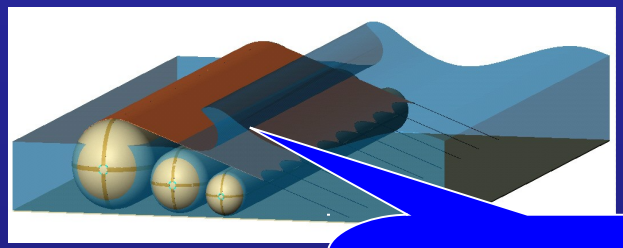
Rapid Port Enhancement Elements

1. Hydrobeam Causeways



Can be bottom based or floating

2. Nearshore Breakwaters



To repair existing or install completely new breakwaters

3. Expedient Dredg

Will not utilize conventional dredging methods

Jet systems used in salvage & treasure hunting opns are promising

4. Pier Load Enhancements – (similar to bridge upgrades)

5. Rapid Road Development

Rapid Port Enhancement for the Theater Support Ves

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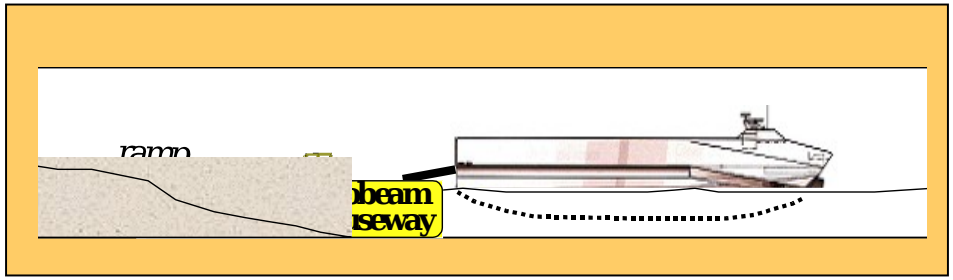
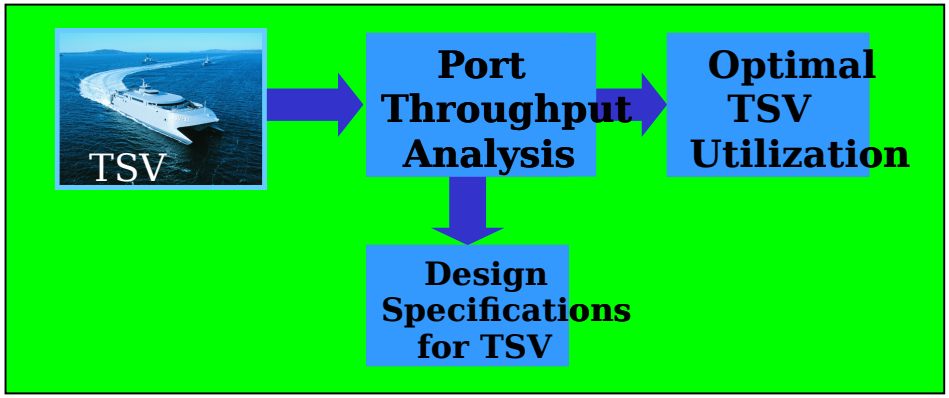


Pacing Technologies:

Causeway Technology Development



Throughput Model Development

STO Attributes:

- **Nominate as DTO: Yes**
- **Nominate as Intl Program: NO**
- **Manufacturability/Reproducibility: Good**
- **Total Program Cost: $**

TOTAL $11.06M

Affordability Metrics:
New systems should be less expensive to deploy than existing slow methods

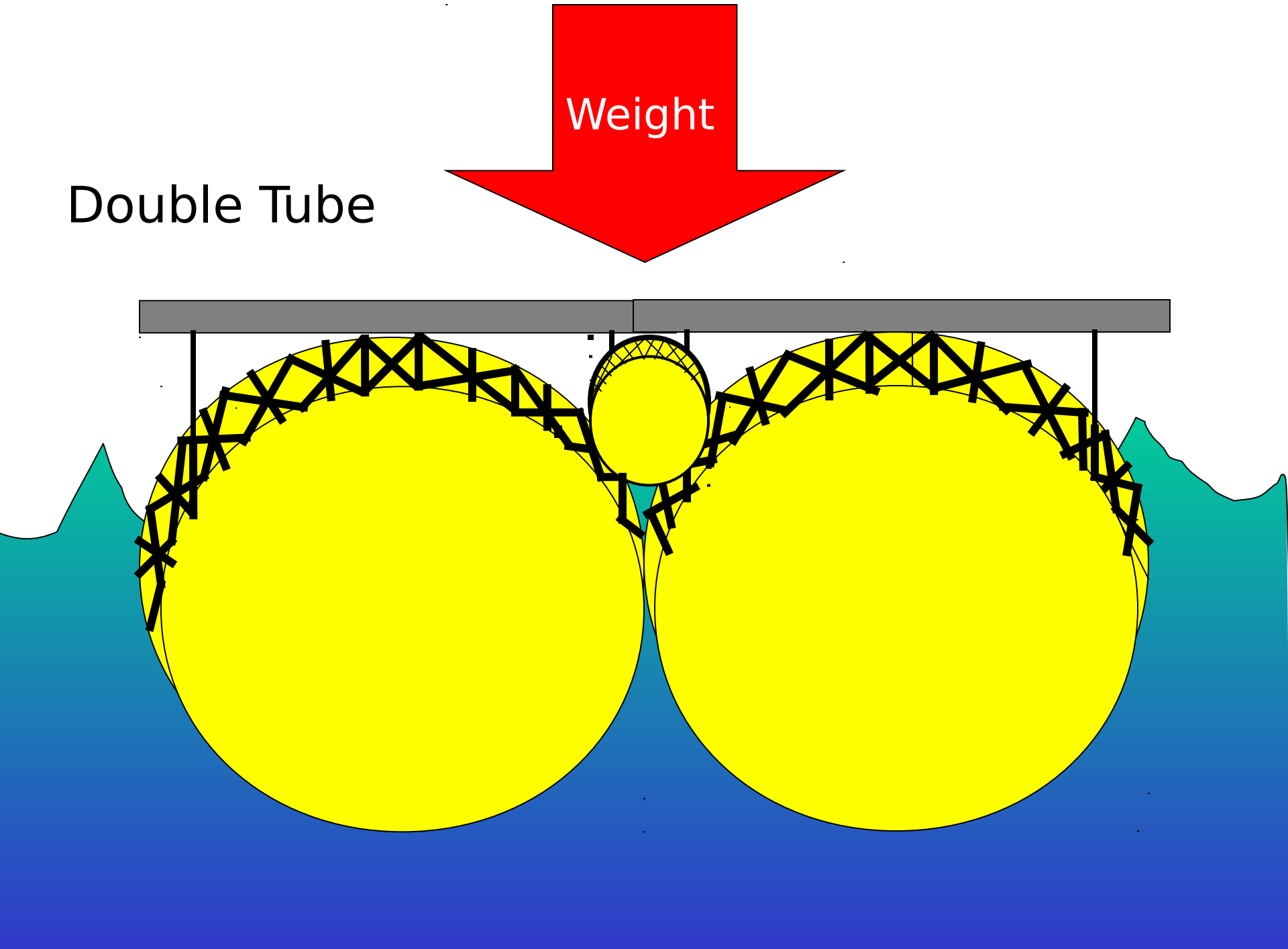
Technology Protection Plan: No

Modeling and Simulation:
- Rapid port evaluation tools
- Simulation of nodal impacts on power projection rates
- Development of nodal impacts on power projection rates

System Components Preliminary Results

	System Elements	Function	Estimated Capac per 20 feet
Causeway	Hydrobeam Tubes	Load Bearing *(bending moments or pressure)*	80 tons at 5psi
	Surface Layers	Spreads Vehicle Loads	40 tons ½ inch Fiberglass Laye
	Wear Surface (if required)	Reduce Damage to Underlayer from Tracked Vehicle	Unknown
Nearshore Breakwater	Multi-tube Structure	Cause Incident Waves to Break and/or Reflect	90%Height Reduction at Freeboard, Height Equal to Wave Height
	Mooring System	Provide Interim Stability During Fill	SS3 on Deployment SS5 by 7 Days, Possibly SS6

Double Tube



Some Technical Issues

- Deployment Mechanism
- Distribution of Wheel Loads
- Traffic Wear Surface
- Material Selection
- System Robustness

Summary

- RPE is an integrated program to enhance the utility of HSSD vessels in logistics/maneuver operations
- ICT formed to provide appropriate guidance for systems development and applications
- RPE now an Army STO
- Technical issues appear tractable